Opportunistic Legacy Marking

Maintenance **F**igure **O**f **M**erit (**MFOM**) 2.0

06-08 April 2010

IUID Benefits

- ***Increased ability to track turn in & rotable pool items***

- ***Increased accuracy of shipboard equipment configuration documentation***

  - Improves logistics support

  - Increased accuracy of the MFOM readiness reporting models

- ***Improved material readiness***

  - Material history retained for life of component

  - Improved insight into the cause-and-effect relationship between resources and readiness

    - Life cycle costs reduced by installing better suited components

  - Enables serialized item management (SIM)

Opportunistic Marking for Legacy Equipment

- ***Marking during normal routine operations***
  - Example
    - Maintenance both corrective and preventive
    - Integrated Logistics Overhaul (storeroom cleanout)

- ***Lower cost***
  - Common marking equipment/materials
  - Reduced training
  - Maintenance technician already performing a similar function
    - Similar to isolating equipment

- ***Non-Invasive***
  - Durable
  - Minimal process change required

One Marking Effort's Costs

Labeling effort – 194 items	Cost
• Personnel	**$32,956**
– (2) Lead Logistician	
– (2) Project Lead	
– (2) Engineers	
• Travel	**$ 3,500**
• Material	**$ 500**
• Total $36,956	
• Cost Per Label	**$190.56**

Does it really cost that much?

MFOM Cost

- ## *Material*

  - *CN3 handheld computer - $ 1630.00 each*

  - *Printer - $ 130.0 each*
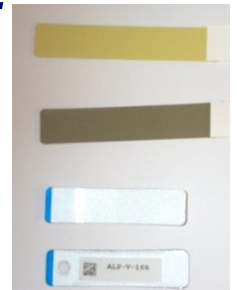
  - *Print labels- ($13.00 /1,000) $ 0.01 each*

  - *Per protective label cover*

    - Hanging - $ 0.87 each

    - Adhesive $ 0.47 each

CN3G

- *Labor*
  - Sailor performing $ 0
  - Maintenance Technician performing $ 4,122
    - Assume $85/hr and 15 min/label

- *Material*
  - Labels (194 x ($0.87+ $.01))
  - Handheld $ 171
  - Printer $ 1,630
- *Total* $ 130
  - Sailor
  - Maintenance Technician

- *Cost per label* $ 1,931
  - Sailor $ 6,053
  - Maintenance Technician

$ 9.96
$

> Site still has a Hand Held device for SIM and materials to hang another 800 tags.
>
> Each additional tag reduces the cost further.

Opportunistic Marking is Cost Effective and Accurate

Challenges/Actions

Challenges

- *Improper Placement*

  Wrong physical label placement on the actual component

- *Permanent Marking Criterion*

  How we know these tags will work?

- *Interferes with Sailor performing duties*

- *Too long to mark everything?*

Actions

- *Marking Guide*

  - Developing a web enabled version

- *Materials used*

  - Yankee Nuclear Power Plant

  - Attached to NECC equipment

  - Corona Testing

- *Opportunistic Marking*

  - Only during routine access to equipment

- *Possible conflict with DoD*

Handhelds

- **USFF Goal is to have one handheld that can perform multiple functions**

  - Working with SSC-A, SEA 04, SEA 08, OSD

  - Currently five handhelds in the mix:
    - CN3G
    - CN3E
    - CN4
    - CN4E
    - CK3

  CN3g   CN3e   CN4   CN4e   CK 3

  - CN3E and G have been tested with AWN, QMS, BCS, and IBS
    - eFSM will be the next to test

  - Plan to be hardware non-specific

Shipyard and Maintenance Availabilities

- *Harsh Environment*

  – Ability to reprint label

- *Maintenance actions may remove label*

  – Unit can provide a copy of the 2D Data Matrix to the shop for re-attachment after repairs if required

- *Added maintenance burden*

  – Simple application of adhesive tag on clean surface

  – Minimal effort required

IUID Large Scale Demo

Class	Ship	Training	Go Live	Remarks
SSN	USS NEW HAMPSHIRE	Aug 09		Awaiting Tag Test Results
DDG	USS FORREST SHERMAN	06 Apr 09	13 Apr 09	
FFG	USS HAWES	09 Mar 09	16 Mar 09	
CG	USS VELLA GULF	May 09	13 Jul 09	
LPD	USS MESA VERDE	16 Feb 09	23 Feb 09	
LPD	USS PONCE	23 Mar 09	01 Apr 09	
SSBN	USS TENNESSEE	May 09		Awaiting Tag Test Results
PC	USS HURRICANE	04 May 09	04 May 09	
MCM	USS CHIEF	11 May 09	22 Jun 09	
CVN	USS NIMITZ	04 May 09	06 May 09	Awaiting new TYCOM nomination
DDG	USS MASON	06 Jul 09	06 Jul 09	
LCS	USS INDEPENDENCE	17 Dec 09	17 Dec 09	
LCS	USS FREEDOM	18 Jun 09	18 Jun 09	
LHD	USS KEARSARGE	06 Apr 09	13 Apr 09	
DDG	USS RUSSELL	27 Apr 09	27 Apr 09	
LSD	USS WHIDBEY ISLAND	11 May 09	15 Jun 09	

IUID Report Findings Highlights

- *100% of 2D barcodes scanned were accepted as unique IUIDs by the National IUID Registry*

- *The CN3G scanner -100% accurate in reading and displaying 2D barcode data*

- *The IUID 2D printer used for this shipboard demonstration experienced multiple errors ~90% reliable*

- *A total of 1013 IUID 2D tags were hung*
  - 30% of available equipment tagged
  - 100% inspected
    - All in place, readable and in good to excellent condition.
    - No tags were painted over, torn, or displayed signs of wear.

Hanging IUID Labels (Ship)

Authorizing Officer
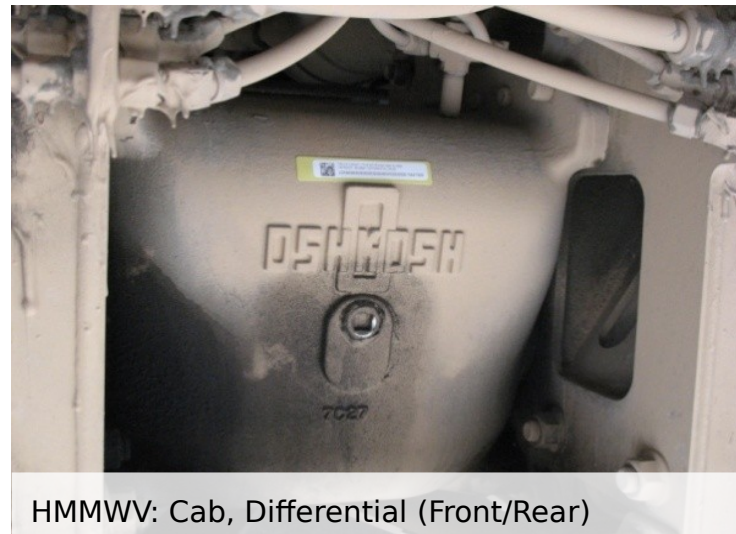

Label Being Hung

Continued Efforts

- ### *RIVGRUONE*

  - Deployed MFOM and IUID software 8 Mar 2010

  - Deployed 5 CN3 handheld units with AWN MobileApp with QCTS interface

  - Training 8 – 9 Mar

  - Labeling effort 10 -11 Mar

    - Labeled – 385 pieces of equipment over 2 days

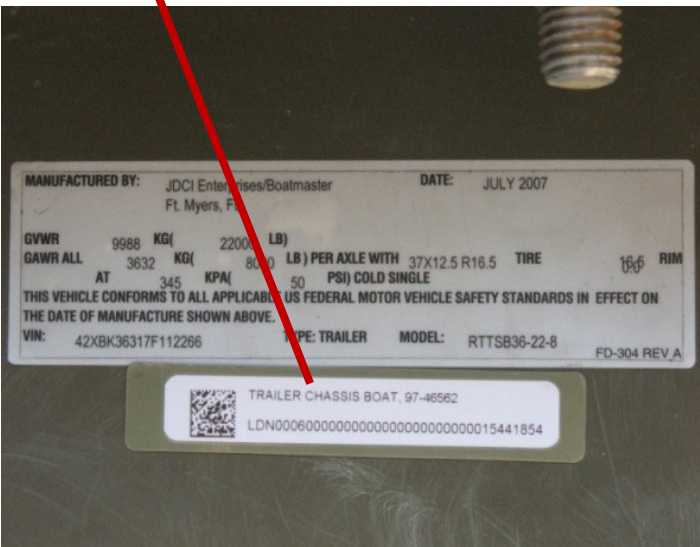 - Model version 3.2 released 17 Mar with improved APL and CDM Data

HMMWV: Cab, Differential (Front/Rear)

RIVGRU One
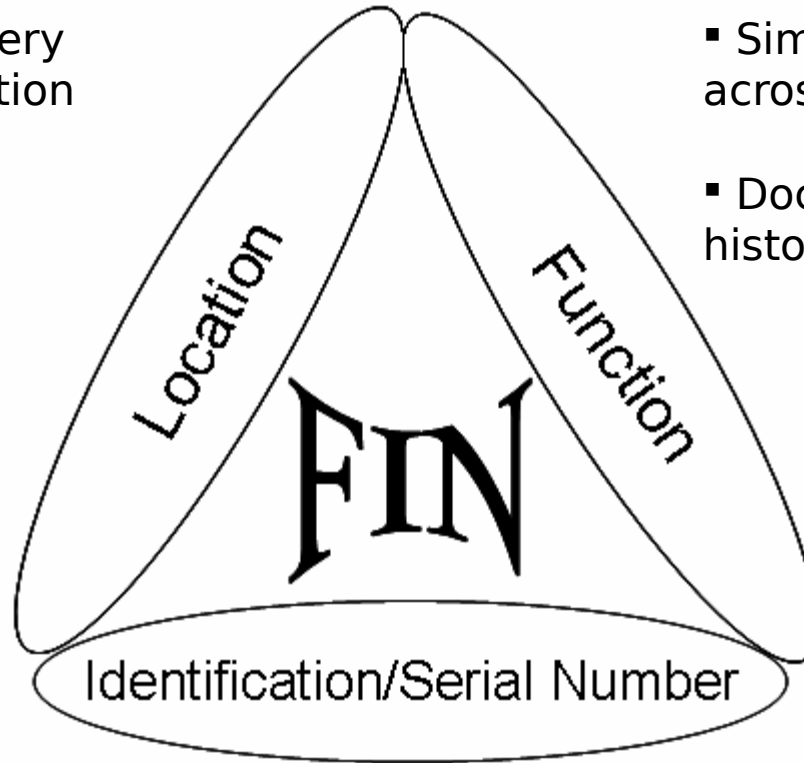

RPB: Trailer, Boat, Engines

FIN
(Location)(Function)(ID)

Functional Index Number (FIN):
An alpha/numeric value assigned to all items in the model.

- Uniquely identifies every shipboard item by function

- Identifies same item across ship classes

- Simplifies retrieving data across ship classes

- Documents material history

Location:
Compartment Number, Compartment Name, or XYZ Coordinates

Function:
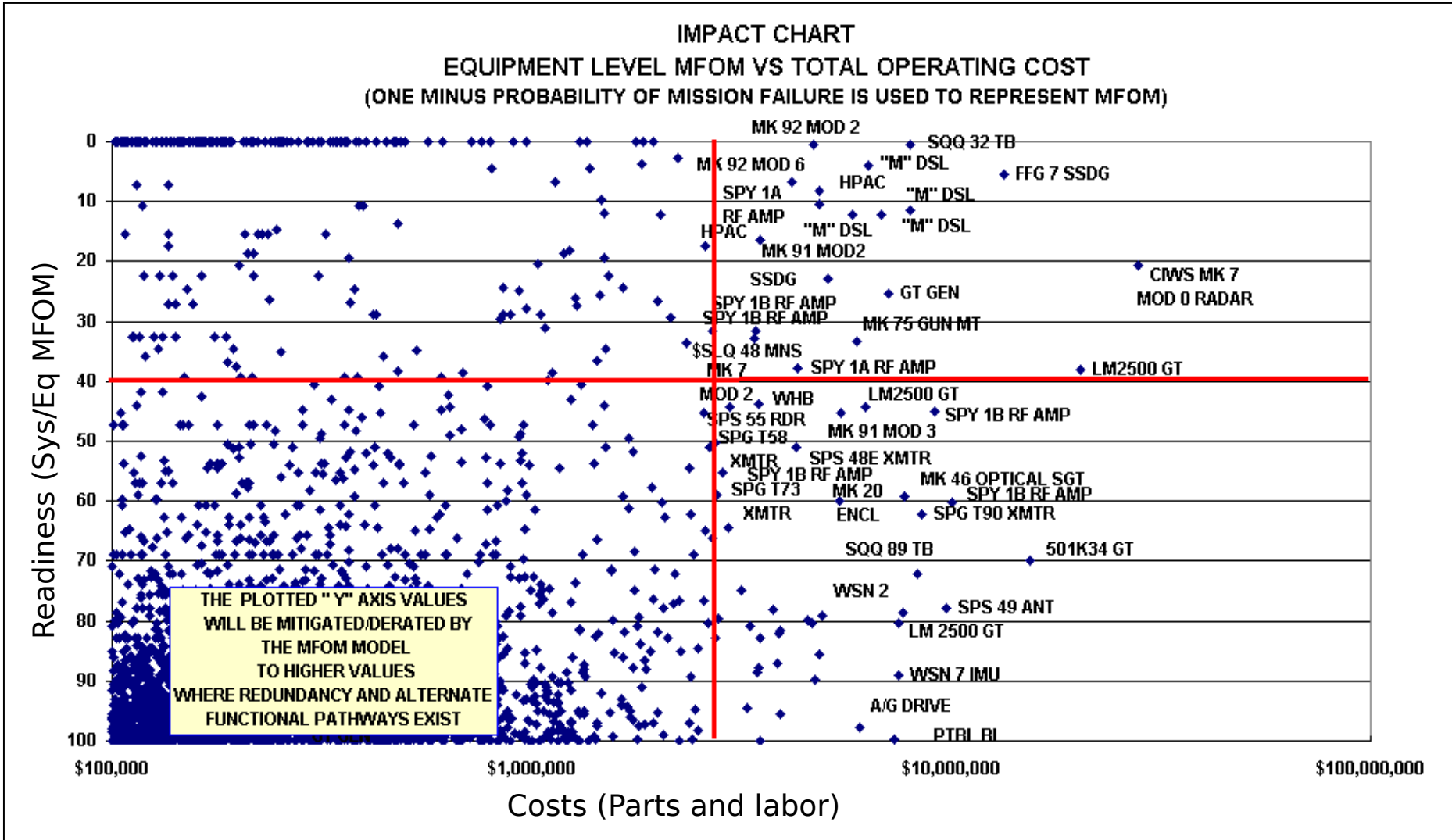Defines the operational contribution, action, purpose or activity of an object.

Identification/Serial Number:
Applies an Item Unique Identifier to an object.
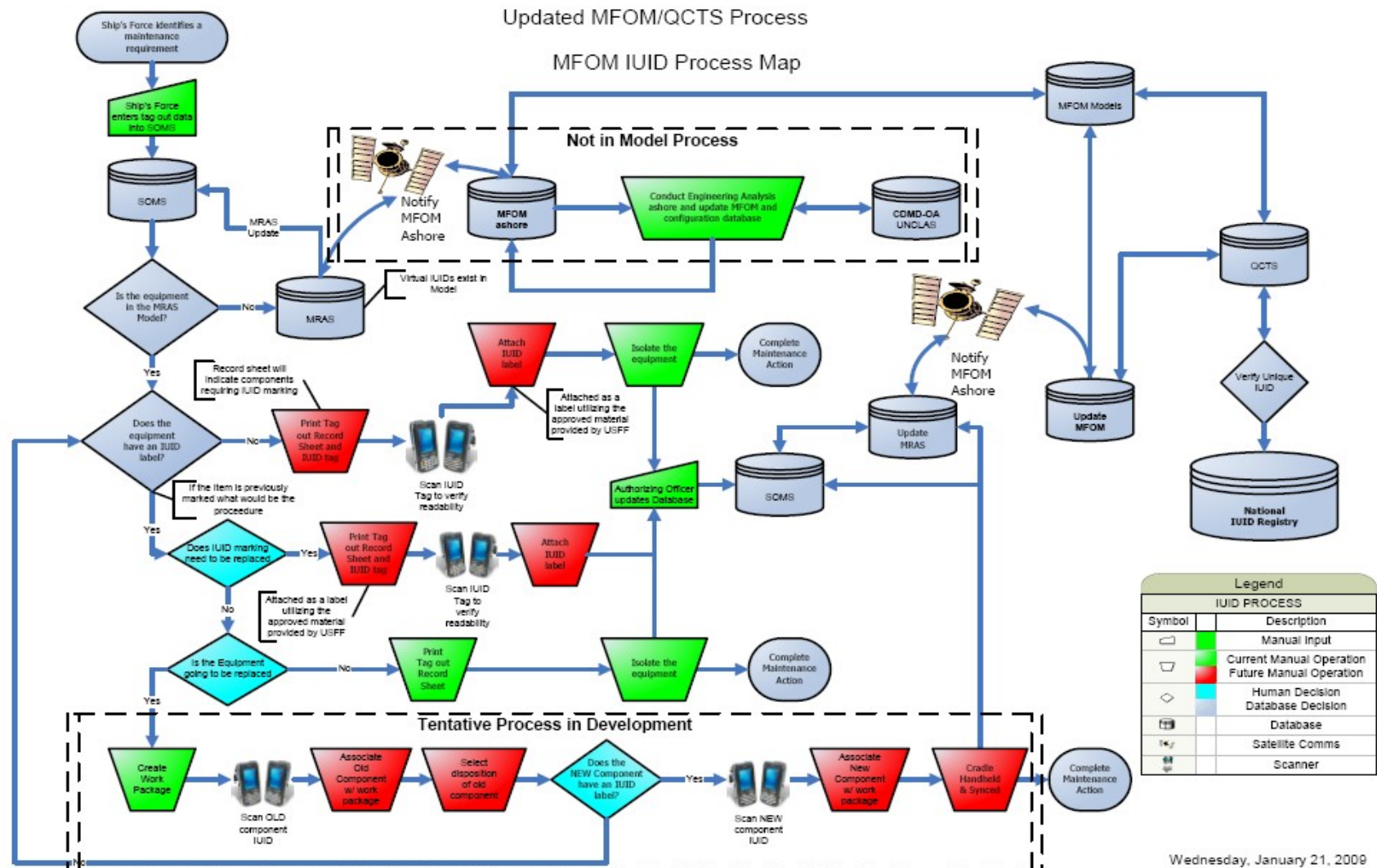Can be composed of an IUID or Material Identification Number.

TMA/TMI Data Analysis

IMPACT CHART
EQUIPMENT LEVEL MFOM VS TOTAL OPERATING COST
(ONE MINUS PROBABILITY OF MISSION FAILURE IS USED TO REPRESENT MFOM)

Readiness (Sys/Eq MFOM)

Costs (Parts and labor)

THE PLOTTED "Y" AXIS VALUES WILL BE MITIGATED/DERATED BY THE MFOM MODEL TO HIGHER VALUES WHERE REDUNDANCY AND ALTERNATE FUNCTIONAL PATHWAYS EXIST

IUID Use

- ## *Hand Held CN3 Computer*

  - Scans IUID 2 D data matrix

    - Maintenance item correctly identified

  - Automated Work Notification (AWN) Mobile Application

    - Links the IUID scanned to the IUID in the model tree

    - Model tree contains

      - Configuration data

      - IUID

    - Work candidate is started

    - Can exchange items with IUID to update model tree

  - Scanner is docked and IUID and work candidate uploaded to AWN

Warfare Area

Gas Turbine

2 Kilo EOC =.8

2 Kilo EOC =.9

2 Kilo EOC =.8

2 Kilo EOC =.9

30 mm Gun

2 Kilo EOC =.9

RHIB

RHIB

2 Kilo EOC =.9

2 Kilo EOC =.9